SHARED BIT LINES IN STACKED MRAM ARRAYS

Abstract of the Disclosure

A multi-layer random access memory device uses a shared conductive trace for writing to the MRAM memory cells. The MRAM has N (where N is greater than 1) stacked magnetic storage elements, where each of the N magnetic storage elements is operatively positioned between a different adjacent pair of N+1 stacked conductive traces. In one embodiment, the MRAM device includes a first conductive trace for generating a first magnetic field in response to a current applied to the first conductive trace, a second conductive trace for generating a second magnetic field in response to a current applied to the second conductive trace, and a third conductive trace for generating a third magnetic field in response to a current applied to the third conductive trace. A first magnetic storage element is operatively positioned between the first and second conductive traces and is adapted to store a bit of data as an orientation of magnetization and rotate its orientation of magnetization in response to the first and second magnetic fields generated by the first and second conductive traces. A second magnetic storage element is operatively positioned between the second and third conductive traces and is adapted to store a bit of data as an orientation of magnetization and rotate its orientation of magnetization in response to the second and third magnetic fields.